

# Generation Conservation

Spring 2010, Issue 2



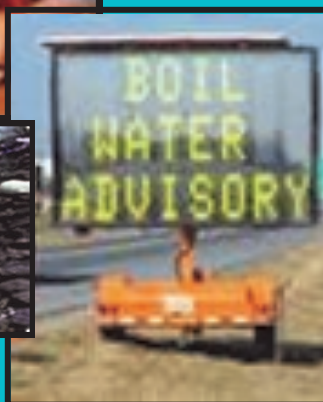
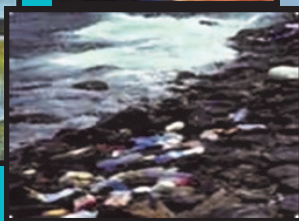
## Iowa Department of Natural Resources

### Inside this issue:

Career Spotlight 2

**ALIEN INVADERS** 3

DNR Camps 4



## You should know...

75% of the earth is covered with water.

97% of the earth's water is saltwater in oceans and seas. Of the 3% that is freshwater, **only 1% is available for drinking** -- the remaining 2% is frozen in the polar ice caps.

The average person in the United States uses **80 to 100** gallons of water each day. During medieval times a person used only **5** gallons per day.

On average, American families use **183** gallons of water each day for cooking, washing, flushing, and watering purposes. The average family turns on the tap between 70 and 100 times daily. By comparison, the average African family uses about **5** gallons of water each day.

**1.2 trillion** gallons of untreated sewage, storm water, and industrial waste are discharged into US waters annually. The US EPA has warned that sewage levels in rivers could be back to the super-polluted levels of the 1970s by the year 2016. – [www.grinningplanet.com](http://www.grinningplanet.com)

In any given year, about **25%** of beaches in the US are under advisories or are closed at least one time because of water pollution.

– [www.grinningplanet.com](http://www.grinningplanet.com)

Greetings!

What you would do if you woke up one morning and turned on the tap and nothing came out? Or smelly brown water came out. All around the world, people are facing just those two scenarios. Hundreds of thousands die each year from drinking contaminated water or dehydration.

In this edition you will learn about some of the water issues facing our state and country. Water is our most precious resource. Water is a necessity for every living thing on this planet. Without it, people, plants, and animals couldn't survive for more than a week.

In America, we are lucky not have those problems, but there is a lot more we can do to protect and conserve our water supplies. Water is not infinite. Water is constantly recycled. **The same water we use today is the same water the dinosaurs used.** What we do to our water today affects the water supply of future generations.

**Together, we CAN make a difference!**

### We want to hear from you!

If you have a story to tell about something you did to help the environment, send it in! It may just show up in the next issue!

E-mail me at:

[Racheal.Bradley@dnr.iowa.gov](mailto:Racheal.Bradley@dnr.iowa.gov)

or

Mail to:

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## DNR Careers Spotlight

Name: Sara Smith | Age: 48 | Hometown: Lima, Peru. Iowa since 1992.

### What do you do at DNR?

I am an Environmental Engineer in the Wastewater Engineering Section (WES). Recently I changed programs within the same section. Before, I used to review applications for construction permits for agricultural facilities (confinements and open feedlots and their manure storage structures) throughout the State as part of the Animal Feeding Operations program, to ensure compliance with design standards and state law. After 10 years, I moved into the State Revolving Fund program and currently review facility plans and construction permit applications for municipal facilities that collect and treat domestic wastewater (sewage) from cities and towns across the state.



**This has truly enriched my life.**

-Sara Smith, Environmental Engineer

### What kind of training and/or education is required for your job?

My job requires a Bachelor of Sciences (B.S.) degree in engineering (civil, environmental, water resources or closely related engineering discipline). You also need to be a detailed-oriented person. Environmental Engineers work in a variety of areas that are essential to protect public health and the environment. This includes designing water supply and distribution systems to ensure our water is safe to drink; wastewater collection and treatment systems to keep our towns clean; air pollution control technologies to protect the quality of the air we breath; waste management including garbage collection and disposal; remediation of contaminated and hazardous sites and groundwater exploration.

In summary, environmental engineers make a significant contribution to society's well-being by designing systems that allow us to enjoy clean and sanitary conditions, without a detriment to industrial development. Environmental engineers preserve our natural resources including public health.

### What did you want to do when you graduated from high school?

While in high school, I loved math and sciences. Before deciding which college to apply, I researched different engineering fields. I was fortunate that my Dad was a general contractor and knew several engineers. One of his friends, was a licensed "Sanitary Engineer", the old name used for the "environmental engineering" discipline. This person explained to me what he did, the importance of this field for the health and well being, and the ever increasing need to train more environmental engineers in response to population growth. This person told me, "there will always be plenty of environmental engineering jobs and work available, so, you won't have to worry". Needless to say, he was right!!!

Can you imagine what our towns, big and small, or our lakes and rivers would look like without properly designed wastewater collection and treatment plants, sewage systems, or without proper drinking water systems and water distribution systems? What about being without waste collection and disposal programs? What if industries discharge unlimited amounts of pollutants into the air?

### What's the best thing about working at the DNR?

I get to work with the best and brightest people from Iowa, all over the country and the world. This has truly enriched my life. Also, as an employee of the State of Iowa, I am challenged every day to work hard, accomplishing many things. I get to speak with consultants, counties officers, municipalities, the public and occasionally, students and the media.

### What's something that you think would surprise people about working at the DNR?

In DNR you will find people with different scientific backgrounds and experience, which is amazing. Our organization employs attorneys, engineers, park rangers, law enforcement, technicians, administrators, biologists, agronomists, etc., all working as a team to serve the people of Iowa.

## ALIEN INVADERS



We are well aware of the damage littering does to our lakes and rivers, but you may not be aware of an even more destructive problem facing our waters - nuisance species. These are plants, animals, or other organisms introduced into habitats that they are not native to. Nuisance species can invade any part of the eco-system, but we are going to talk about the aquatic (water) type.

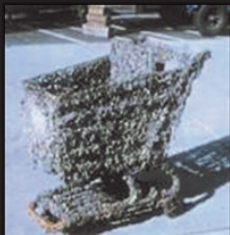


Aquatic nuisance species are moved from one body of water to another by humans. They hitch rides on wet boats/trailers, fishing tackle, ballast tanks (water tanks that help ships stay balanced), or in boat bilge (water that collects in the bottom of a boat). Because of this, they are often referred to as "aquatic hitchhikers". Nuisance plants grow and grow, eventually blocking sunlight from reaching through the water, depriving native plants of valuable nutrients. These native plants provide fish-cover, food, and spawning grounds for fish and other aquatic life. Nuisance fish species prey on native species and compete with them for food. Nuisances can also breed rapidly, since they have no natural predators in their new environment.

One invader, the zebra mussel, is only  $\frac{1}{2}$  to 2 inches long and attaches itself with "strings", called byssal threads, to any solid surface including other mussels. Zebra mussels are native to the Black and Caspian seas. Scientists believe they hitched a ride to the United States on a shipping vessel that ported on the Great Lakes. Once they got here, they quickly spread through the country. In Iowa, zebra mussels made their first appearance in 1992, in the Mississippi River. Just one year later, they had spread from border to border. Zebra mussels live for 4-5 years and reproduce very quickly. That means a water body can be free of zebra mussels one year, then the next year have its entire bottom covered in them.

Zebra mussel colonies can have up to 700,000 mussels per square yard! They are so destructive because they eat tiny plant life in the water, which robs native organisms of their food source. They also kill native mussels by completely covering them, causing them to be unable to open. By the size of their colonies, it's understandable how something so tiny is able to totally destroy a habitat!

Zebra mussels do have natural predators such as crayfish, waterfowl, and muskrats, but there would have to be a whole lot of them to stop zebra mussel invasion. One adult crayfish can consume nearly 105 zebra mussels every day, but with adult female zebra mussels laying between 30,000 and 1 million eggs per year, you can see how even crayfish couldn't keep up! *Continued next pg.*



Examples of zebra mussel damage.



**ALIEN INVADERS continued** The cost of fighting the pests at power plants and other water-consuming facilities is \$500 million a year in the U.S., according to the Center for Invasive Species Research at the University of California, Riverside. They clog intake pipes, causing expensive repairs to our drinking water facilities. Another nasty consequence is swimmers can get cut on their sharp shells.

Some of Iowa's other identified aquatic invaders include: Asian carp (bighead and silver), rusty crayfish, spiny water flea, Eurasian milfoil, brittle naiad, curly-leaf pondweed, and purple loosestrife. Millions have been spent on draining lakes to clear them of some of these species. Most are brought into our waters by unknowing recreational boaters and commercial fishers.

The good news is we can stop or slow the invasion of zebra mussel and other species by taking a few actions when we use our waters:

- Inspect your boat, trailer, and equipment and remove any visible plants, animals, or mud before leaving a water body.
- Drain water from your boat, motor, live well and bilge before leaving a water body.
- Dispose of unwanted bait in the trash. Never release fish, animals, or plants into a water body unless they came from that water body.
- Rinse or dry your boat, trailer, and fishing equipment to remove or kill species that were not visible when you left a water body. Before transporting to another water body, rinse with high pressure and/or hot (104 degrees) water or dry for at least five days.
- Learn to identify aquatic nuisance species and report any suspected sightings to the nearest DNR fisheries station.



Asian Carp



Spiny Water flea



Zebra Mussel



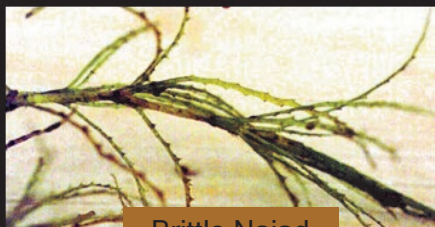
Rusty Crayfish

### Nuisance species found in Iowa.

Eurasian Milfoil



Curlyleaf Pondweed



Brittle Naiad

Purple Loosestrife



To learn more about these alien invaders, go to <http://www.iowadnr.gov/fish/news/exotics/exotics.html>

## Iowa Department of Natural Resources

Leading Iowans in caring for our  
natural resources.

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## Natural Resource Opportunities for Educators

### American Wilderness Leadership School (AWLS)

AWLS allows educators of all types (teachers, scout leaders, etc.) to experience a variety of outdoor skills. If you are inexperienced in the outdoors and always wanted to learn, or if you are already at a higher level of outdoor skill, and want to learn more, AWLS is for you. It is co-sponsored by DNR and Safari Club International. Two workshops are held each summer.

AWLS I Activities: canoeing, prairie excursion, backpacking, fishing, plaster casting, orienteering, archery, pond life, rifle shooting, muzzle loading, and shotgun shooting

AWLS II Activities: biotechnology, water quality, fly-fishing, bird banding, trapping, canoeing, camping, and lure making

For more information, contact AJay Winter at 641/747-8383, or [AJay.Winter@dnr.iowa.gov](mailto:AJay.Winter@dnr.iowa.gov)

For more information or to find out about DNR's other educational  
opportunities, visit:

<http://www.iowadnr.gov/education/index.html>

## 2010 YOUTH CAMPS AT DNR

### Outdoor Journey for Girls

Outdoor Journey for Girls (OJ) is a 3-day, 2-night workshop aimed at introducing outdoor skills to girls ages 12 to 15 in a supportive learning environment where they have opportunities to try things "hands-on". The outdoor skills include:

Canoeing & Water Safety  
Fish & Wildlife ID  
Archery  
Furbearers/Harvesting

Preparing Your Catch  
Firearm Safety and Basic Shooting  
Conservation and Management  
Fishing at the Lake

Camping & Outdoors Survival  
Orienteering & Compass  
Game Care

OJ is sponsored by the Iowa DNR and Iowa Women in Natural Resources, with Iowa Pheasants Forever chapters providing full or partial scholarships for most attendees.

### Hunting and Conservation Camp

The Hunting and Conservation Camp (HACC) allows young men ages 12 to 15 to experience many activities available in Iowa's great outdoors. Activities are led by experts in their field, which allows the participants to leave with a newfound confidence in old and new skills.

Participants are allowed to experience outdoor skills including: shooting (shotguns, rifles, muzzleloaders, archery, and atlats), trapping, dog training, hunting (waterfowl, deer, and turkey), gun care/cleaning, game calling, and conservation.

HACC is sponsored by the Iowa DNR and Pheasants Forever.

For more information about these and DNR's other youth activities, visit:

<http://www.iowadnr.gov/camps.html>